Combined information gathered from the Coral Reef Fishery Management Stakeholder meetings held on O‘ahu, Maui, Kauai, and Hawai‘i August 13-26, 2003 and submitted survey forms through November 4, 2003.

1.) What is your impression of the condition of coral reef fishery resources in the Main Hawaiian Islands?

General observations:

- Some anemones in Hanalei are gone!
- There has been a serious decline in the condition of the reefs.
- See few manta rays in Honolua. Conditions have deteriorated even though the area is protected. Net loss of species noted.
- Locally our coral reef are being destroyed
- Damaged and Depleted
- Greatly depleted compared to the 1960’s when I first dove here
- Coral reef fisheries in Hawaii are stressed from fishing, pollution and runoff
- It has depleted the number of fish, coral is being destroyed, the water quality is worse, more murky, a lot more algae, rapid population is the cause we are loosing our most important resource.
- In 27 years, have watched our marine resources decline perilously, then began to recover under protection
- Overall poor, fair at best, somewhat better in least accessible areas.
- Noted dead coral over years of diving. Fewer species present off O‘ahu. Cabo and other dive spots are in good shape relative to O‘ahu.
- Compared to “60’s” not very good
- Larger areas are showing evidence of increased algae growth while prevalence of coral and fish on the decline.
- They (sic) need help. Allowable uses now are a problem. This coupled with a lack of management work against the health of the resource.
- I haven’t visited enough areas to have a valid opinion. There are a wide variety of coral environments in Hawaii with different problems and needs.
- For the most part the reefs themselves are pretty good.
- I think that the reefs are in serious trouble. There has been a huge decline in fish populations and I have personally seen a lot of dead or damaged coral. In some areas, there’s no coral left at all.
- Serious decline
- Depleted and dying
- They’re having a hard time and are not well maintained for cared for.

Fish related observations:

- Fish pictures in Hawaiian Fishing News – help promote lots of fish (more than needed) being caught
- How often see uhu or parrot fish anymore? The numbers and variety are less. There are more algae.
- Areas that were closed along Kona Coast had more fish
- 30 years of fishing, lots of fluctuation in species diversity.
- Need to look long-term fluctuation in populations to determine what is "overfished"
- CPUE is going down overall
- No good data on recreational take – no long-term data to determine decline.
- Fishing from shoreline – their major decline is due to pollution.
- Decline of fish out to 60 ft. is due to pollution, nets, spearfishing, near population centers.
- In areas without access still have good fish stocks
- Lots of lobsters are being removed. Don't see large lobster when diving anymore.
- Fewer top predators in main Hawaiian Islands. Reef sharks, ulua are scarce – a reflection of the health of the reef.
- Honolua Bay conservation areas – don't see akule any more. There used to be schools numbering in the thousands.
- Concerned about the enormity of gathering lay nets left and lost by commercial fishermen that damage the reefs.
- Near shore fish and invertebrates are declining in numbers, particularly fish and inverts sought for food
- Declining, fewer fish, less diversity
- Poaching still occurs in reserves and in NARS in Honolua Bay. Conditions are still better there for some food fish like aholehole.
- Yellow tang only seen in reserves these days. Aquarium collection has depleted stocks on the big island. Signs of a decline evident on Maui.
- The nearshore reefs of the MHI appear to me to be highly degraded on O'ahu less so on the neighboring islands.
- Kihei old timers could see ulua and other predators at the shoreline. No longer visible. Kona crab could be seen being eaten by ulua within 10 feet of shore.
- Decline in mollusks, opihi, octopus, and cowry's noted as well.
- Where resources protected conditions look more promising. Fish community based within a region. Within a 1/2 mile a noticeable difference.
- Hanauma looks pretty good these days. Some species are increasing in numbers.
- Off Makapu'u there is old coral near the Seal Life Park pier – but not a lot of fish. Populations small in size – at least during daylight hours in the shallow areas.

- Big Island biodiversity compromised. Quantity and diversity of ornamental fish has declined. Gill netting during childhood in Kaneohe yielded abundance of fish. This is no longer the case.
- Look at the different types of fisheries. Bottom, ornamental, and papi'o. Akule may be ok.
- Kaneohe Bay recently – no fish visible for extended area. This represents contrast to Hanauma Bay.
- Parrotfish over 4" infrequently visible to snorkelers. Maui showing similar conditions, but not as badly degraded as O'ahu.
- Pupukea/North Shore MLCD's have evidenced differences in health of resource inside/outside of MLCD. Big parrotfish visible in the MLCD.
- O'ahu is fished out. Hanauma Bay jacks, predators, parrots are significantly larger in the protected areas, compared to adjacent non-protected areas.
- Some fish are localized. You can see the same fish year after year. One taking of a large number of fish has long-term impact on the area.
- Declining in most species – except in protected areas where gill netting and bottom nets are prohibited. Size of brood-female is much smaller than 30 years ago. Some species probably endangered
- A diver with 10,000 dives experience noted serious degradation of the resource. Areas protected from the collection of tropical reef fish show marked improvement.
- The fisheries resources are in poor shape.
- Depleted
- They are declining at time, when harvest pressure increases
- Everyone knows it is poor due to gill netting but politically nothing done.
- Moderately/severely depleted
- More fishermen so more fishing pressure
- Their diversity and abundance are declining due to overuse
- They are having a hard time and are not well maintained
- Certain resources are stable, but the majority has been depleted (but not endangered or threatened status)
- Poor, overfished dramatically, too many gill/lay nets, not enough enforcement
- I am observing a steady decline in the population of all well sought after fishes and marine animals, e.g. Jacks, goatfish, lobsters, moi, uhu, m~ uku, etc. Sighting of certain species like Kumu in the 2 to 3 lb range and larger is very rare these days. The decline in these marine animals is a direct result of over fishing; pollution is not a factor or is very minis cue. I say pollution is not a factor because I have observed areas like in Pearl Harbor (which is heavily polluted from past Naval use and Naval industrial work, and remnants from the Dec 7 bombing) where I have dove during work as a Marine construction engineer and have observed an abundant and healthy fishery there, amidst the pollution (it is a lot better now because of strict EP A regulations and enforcement, but remnants of early Naval

industrial work is still there). No fishing is allowed in Pearl Harbor Shipyard and Sub-Base area and it shows by the abundance of fish and marine life.

Pollution run-off related observations:

- Greatest impacts to habitat are in areas with major agricultural production/runoff.
- Very poor uncontrolled runoff – the main cause
- Dept of Transportation sprays roadsides and is killing plants – denuded hillsides – nothing green on sides of road, soil goes straight into ocean.
- When it rains here the water turns to mud – partly from feral ungulates (pigs and goats)
- Runoff and herbicides are a key effect – not only to the reefs but also on the fish
- Also effect the other organisms that fish feed – ecosystem wide effects
- Sediment runoff at Maalaea – streaks of runoff noted to Molokini
- Crevasses filled in some sections – not much substrate showing above the dunes.
- Snorkeling on Oahu – seeing fewer fish, smaller fish. Predators (jacks) only seen at Hanauma Bay. Same is true for parrot fish – juveniles only.
- Reefs at 30 feet or more show larger fish and more diversity of species in protected areas.
- Schools visible cleaning reef areas on Maui, less the case on Oahu.

Alien Algae observations:

- Alien/invasive algae is a major problem on Oahu and Maui. Fish populations depleted on Oahu except for Hanauma Bay they seem sterile. Water quality is poor. Estuary area is degraded.
- Alien algae not as bad on Maui as on Oahu. Pops up every summer. Sometimes species vary. They are now more prevalent than before.
- Windward side of O'ahu – snorkeling reefs show significant amounts of algae (particularly in Kaneohe) as well as sediment at the mouth of the streams.
- Maui off shore live coral, less so on O'ahu. Waikiki coral is scarce. Scuzzy reefs with lots of alien algae off Waikiki.
- Participant with Reef Check and diving experience over the last 20-30 years characterized O'ahu snorkeling as "disaster zone." Significant impact of anent species evident especially in Waikiki. Live coral is present, but often smothered by alien species. Live coral barely registered in transects.
- Introduced species (such as groupers) represent a threat to native species (lion fish).

Storm observations:

- North shore reefs are cleaned and scoured by wave action.
- Wave action and storms are partly responsible for degradation of areas. Other anthropogenic factors slow recovery.
- Northwest swells come into the islands and tear up the bottom of some areas while other areas are unaffected. Understanding the factors (topography, etc.) that protect certain areas and applying this knowledge to more vulnerable areas could help mitigate damage.
- In January, Kona experienced the highest surf in 23 years. This left a swath of busted coral. The area now serves as a recruitment/nursery area for juveniles.
- Winter storms and topography affect the abundance of reefs. Hawaii has fewer coral reefs. Geological history of the island makes a difference in formation of reefs. Can make blanket assumptions about how models elsewhere working in Hawaii.
- Run-off and sedimentation after storms significant.

2.) **If you were responsible for managing coral reef in the Main Hawaiian Islands, what would you do to manage fisheries for the long-term health of the resources?**

Pollution:

- Need to address the impacts from pollution at the time it occurs and during rates of recovery.
- Buffer zones along streams to reduce dirt, etc.
- All coastal development must use vegetation appropriate for climate to reduce water, chemical applications, etc.
- Larger shoreline setbacks.
- Move highways back from shoreline. Let there be a breach again – a natural shoreline.
- Eliminate agricultural and urban non-point pollution.
- Look at fuel
- Put mobile pump out facilities in the harbors. Require their use. No more pumping in the ocean.
- Human waste treatment. Look at contribution of nutrient load in water discharged.
- Cesspool leaching affects reef conditions.
- Limit (enforce) human activities; especially near shore development; fund/appoint full time advocates to speak for the reef/fish to match developers advocates
- Make sure all living along the shorelines are hooked up to the sewer line, have more enforcement to control poisoning in the coral more extensive education for people to protect and preserve the coral reefs and shoreline.

- stronger controls on land grading.
- Create buffer zones between resorts, golf courses, developments and the ocean.
- Establish limits on the number of golf courses and/or developments.
- A 1000-foot set back is under consideration on Maui.
- A 1200' setback was discussed at a meeting at Konawaina a few months ago.
- Don't forget what's going on on the land! Pineapple, cane fields and other sources of runoff deserve attention. Storm water management policies should be examined.

Education and outreach:

- Education in school systems means kinds know how the environment is to function and what harms it
- Install "stewardship" in our children
- Educational outreach is needed statewide. Public TV programs addressing the state of the reefs, interviews with biologists at DAR, provide information about the NWHI and who findings of the CRTF.
- Coordinate with DAR, DOE curriculum for use in schools regarding reefs, fisheries and our role in protecting same.
- Teach children and the public at large about what's going wrong with our resources. Provide information about what we can do. Use broad stream video.
- Tie in educational and stewardship efforts with Hawaiian organizations.
- Education is important for local villages etc.
- We have to make a major change in mind set from "What we want, when we want it" to a more conservation oriented mentality. Conduct education where people can actually learn. Boat harbors, for example, are the gateway to the ocean. They would be a good educational site.
- All weather, outdoor roadside panels pointing out interesting reef features off shore. Describe the resource. Tell what's being done to protect the resources. Identify snorkel sites.
- Educate, enforce, and protect
- PSA's and more media involvement should be explored.
- More education needed regarding taking of fish that have not yet reached reproductive age.
- Educate policy makers, business leaders and management about the importance of these resources to the state economy. Their understanding of these issues could result in more thoughtful, less exploitive decisions going forward.
- More strategic commitment to education is needed. Increase these efforts. Use more opportunities to conduct large-scale TV educational efforts. Give sufficient time to familiarize the broader public with the systems and issues in this area.

- Educate all to appreciate and realize the connection all living beings creatures – respect for all life.
- Educate people – “Protect or Lose” coral reefs and fishery resources. Use TV (PBS) Programming, Curriculum in elementary and middle schools.
- Launch a massive education campaign regarding the benefits
- Rate of degradation needs to be emphasized to visitors and resident users too.
- Emphasize the value of the resource to our economy (not just for tourists, but for fishing as a traditional cultural practice that should continue into the future.
- Long range public education efforts should start at the elementary levels. We should strive to educate an entire generation. Teach them what happens if coral reefs disappear. What will be lost? Schools and teachers need to know and share this information.
- People don’t know the rules.
- More outdoor education should be implemented.
- Education of reef users and public at to the need to preserve reef an ocean health – change the mindset that we can take all that we want.

Enforcement:

- Make abusers accountable – peer pressure and identification of the violator.
- More enforcement, more enforcement, more enforcement.
- More than 1 boat per island, more $, dedicated night teams (lobster, ulua, uhu).
- Inclusion of old timers and people who knew resources 50 years ago as well as other fishermen practice development to reduce amount of resources needed for enforcement.
- Specialized enforcement knowledgeable about specific species needed vs. consolidation of all natural resources enforcement responsibilities to a few.
- Internship program for enforcement positions to help get 24-hour enforcement.
- Get tough – pull licenses of violators.
- Better enforcement and mandatory education of crew.
- Judges need to make sentences that hurt violators once, caught.
- No state observers available to help with enforcement. Some federal observers are available to track regulations.
- Beef up and provide enforcement to insure compliance with the existing regulations.
- Involve communities in protecting coral reef areas. “Adopt a reef” programs at the local level to keep the areas clean, prevent over-fishing, limit gill netting, reduce night spear fishing to foster increased presence of diverse species. Follow PUS example.

- Enforce and obey rules to create safe areas for reproduction and maturation.
- More enforcement officials are necessary
- Toolbox is a good start. Enforcement needs to be strengthened. Direct more money to get more enforcement out into the field.
- Spend more money to increase enforcement.
- Increasing the size for legal catches doesn't help much without effective enforcement.
- Beef up enforcement.
- Put teeth back into enforcement. Give enforcement officers the authority to look into people's catch – authority to inspect. Allow them to ascertain what is being taken.
- Enforcement is needed.
- Education of judiciary. We need a natural resources court. Set up something like the drug court with dedicated judge and/or court.
- More enforcement and policing of protected areas and stiff penalties for any offenders of the regulations
- Make enforcement more visible and more accountable to enforce regulations
- Get more DOCARE officers and create a management plan for the long term
- Establish sustainability with local consumption/use with the highest priority.
- We need strict enforcement of our laws, and initiating a fishing license fee to get funds to support enforcement and education. Commercial fishing license already exist, but we need to establish recreational licenses fees, e.g. $10 to $20 dollars annually (small price to pay for a healthy fishery for generations to come). Once enforcement officers are in place, have periodic audits of enforcement officer to make sure they are not patronizing certain people.

Traditional use and Community-based management:

- Fisheries should be reverted back to more of an ahupau'a – moku – management to the local community.
- Bring in a community based management system to the people using the resources
- Manage for the whole watershed – out to the reef
- Need to ensure there is coordination between mokus (some decisions island wide perspective)
- Traditional practice of caring for ko‘a may merit consideration.
- All islands restore old fishponds. Get them on line. Use fishponds in a multitude of ways: Commercial, education, tourism, hatcheries, etc.
- Restore stream flow. Stream animals spawning provide food for ocean fish.

- Set up Ahupuai systems
- I would establish local/regional groups to provide input to reach consensus on management strategies
- Community-based traditional fishery management practices (such as nurturing the kola and cultivating the stocks) should be revisited.
- Involve the community first. Community based management consensus should drive strategies for specific areas. Rules made by the people may result in better compliance and less reliance on enforcement.
- Adopt the West Hawaii Fisheries Council management recommendations and processes statewide.
- Kapu kapu: the konahiki was responsible for keeping specific specie for his own. He was also responsible for managing the resources for the ahupua'a. After a certain period of time the kapu would be lifted. At that time everyone would share in the take – even other ahupua'a associated with resource protection.
- Restore the Hawaiian nation. Hawaiians know these areas. You have to be with a Hawaiian before you can own land.
- Support community-based management where possible

Marine Protected Areas

- Long-term large marine protected areas consisting of water out to 60' or 11/2 mile Start with areas that are still viable or areas without sediment runoff.
- Take a long-term approach, seeking ways to restore the health of coral reefs in the MHI, including restoration and prevention of degradation of watersheds, and more effective steps to control overfishing. Wider use of MPAs, including no-take reserves is needed.
- Reef fish recruitment and nursery areas need protection too. Coral polyps vulnerable especially during reproductive phases re: lunar cycle.
- Moratoriums for 2 years – reopen later and institute next in adjacent areas.
- Marine reserves with no take. Work. Eve if it means no human impact, no diving, etc.
- Establish areas (that are currently underutilized for recreational fishing due to their inaccessibility) and establish MPA's to enable to support/sustain healthy habitat that will contribute to the increased diversity of species.
- Create marine protected areas get communities involved in the management of land next to the coral reef resources.
- More habitat areas need to be protected.
- Problem with restrictions depends on enforcement.
- Set up a series of marine sanctuaries with limited fishing – like in the Philippines.
- Marine sanctuaries spaced around the island could capitalize on spillover. DAR booklets exist with statistics, which could be used in schools.

- marine protected areas
- Establish multiple large MPAs, No take areas; involve communities in management, educate public to benefit of protection
- Develop and implement and enforce large areas of MPAs
- Protect recruitment areas, protect spawning aggregations, avoid putting pressure on decline populations, tract sustainable yield
- More (and larger) protected areas needed to have significant impact..
- We need to "bite hard" and close some fishery nursery areas. Consider changing the starting point for protected areas boundaries. Have new boundaries that begin just outside of areas accessible to hook and line fishermen. Implement closures in places that make sense.
- Establish many more MPA's.
- If fish populations increase in FRA's shouldn't we increase the size and number of FRA's? If there are fewer fish in FRA's, then shrink them or reduce the number of them. Get data to understand the actual impact of FRA's on fish population status.
- Establish and maintain marine sanctuaries at a variety of places throughout the islands.
- Work with the CCN and LLMA network (John Parks) as to what they manage and how in the Philippines and the Pacific, Tahiti, Roratonga, etc. (use as model to establish managed areas locally)
- Need protected areas on Kauai
- Establish more marine conservation and marine protected areas.
- We need more reserve areas, no-take. If we protect more areas and prohibit fish feeding and enforce that, it will do a lot to improve the condition of our reefs.
- No-take areas spread throughout the archipelago.
- Establish marine reserves – many more and protect them
- Create more MLCD's as recruitment areas
- Create more marine protected areas, involve communities in marine resource management

Other Fishery Management tools:

- No gill netting.
- No night spearing on scuba. No sale allowed of speared fish.
- No use of lead sinkers.
- If rent gear, mandatory video and educational material review prior to issuance.
- Spear fishing is currently viewed as a prerogative. This is contrary to Hawaiian cultural practice of learning from Kupuna as an apprentice first
- If we do one thing, we should get rid of lay gillnets
- Subsistence fishing only
- Decrease bag limits, increase size limits, outlaw gill nets and sale of all reef fishes in local markets.

- Consider issuance of fishing licenses. Use the revenues for improved enforcement. This is contrary to local practice
- No more long-liners.
- Fishing licenses and required education classes or reading material (viewing a film?)? Prior to issuance of permit.
- Owner of sporting goods stores won't sell nets.
- Limit the number of fish one can take; Have a season to take one lobster or octopus of the reef each
- Instate a fishing license to get money for enforcement and management
- Ban Gill nets, ban aquarium takings
- Get rid of lay gill nets, fish traps, night spear fishing
- Ban/prohibit gill nets, night spear fishing, bottom nets (at least 5-10 years)
- Restrict certain areas or gear or methods of fishing/use
- Put restriction on various groups and make laws to protect them from harm
- Create serious management rules for fisheries (not ban fishing)
- Restrict the harvest of threatened species
- Ban gill netting
- Charge a license fee; use money to enforce al fishing, netting laws.
- I have spearfished in various locations on the US, and California probably has best fishery management program that I have seen. They have strict size and bag limits on take for marine animals and they have the personnel to enforce these laws. My experience in Northern California clearly reflects their efforts, i.e. the seafloor along the shoreline is encrusted with large red abalone and the well sought after rockfishes are everywhere. Hawaii needs to follow similar California type fishery program. Currently, Hawaii has no bag-limits or the bag-limits that are in place are too large to be of any use, and that is one of our biggest problems. **Hawaii needs to establish reasonable bag limits that are small enough to be help the fishery**, e.g. 2-Uhus per person per day, 2-Kumus per person per day, 4-lobster per person per day, etc. Have annual caps on species for commercial fishermen. Forget about MCD as a management control method; they don't help, they are good fish concentrators, but I haven't observed any spill over from these locations to surrounding areas. Current number of marine reserves are enough.
- There needs to be an annual cap on species for commercial fisherman. And periodic fish offload checks on commercial fishermen by enforcement officers and auditing groups.

Recreational use and tourism:

- Fish feeding should be made a felony.
- Especially no feeding where species are intruding.

- Include boating industry in dialogue. They have an impact with snorkel, diving, discharge, exhaust, etc. (and fish feeding).
- Boaters could have a positive impact educating clients re: coral and fish feeding.
- Establish alternating permitted user days for Molokini and/or passenger limits.
- Before deplane – get snorkel license. There is no fee involved, but an educational review of material required before issuance of decal to permit snorkeling.
- Impact video on in-flight movies for all incoming flights to Hawaii.
- Preserve reefs by restricting commercial tourism overuse
- West Hawaii should consider a cap on the number of cruise ships that can visit. No one knows much about the impact of multiple ships presence offshore.
- Rotation of marine mooring buoy systems facilitates recovery of damaged areas.
- Look into methods used at Bonaire where passes are sold to gain access to the marine park. Fees from the passes are used to support protection of the area. This practice in effect since 1975.
- Bonaire also requires check out dives to assess divers' buoyancy and skills before allowing them to dive without instructors.
- Bonaire collects a $20 fee from departing visitors at the airport. These revenues are applied to conservation practices.
- The dive industry in Kona is exploring the use of a diving "use" fee. Consideration should be given to instituting a general user fee – similar to fishing permits. Fees could be used to support enforcement efforts.
- Limit Kayaks! Supervise and monitor their behavior; no chasing dolphins by tour boats; there aren't even any signs to inform people at either aforementioned bays
- Many more boat moorings.

Artificial Reefs:

- Develop more habitats – include use of artificial reefs
- Island reef platform is flat. Create topography by using artificial reefs and other means to support creation of additional recruitment areas.
- Create more habitat by use of artificial reefs for juvenile fish

Other Ideas:

- Try to restore habitat to promote fish recruitment.
- Restrict activities that cause harm or damage
- Just let things take their course as they are. Do nothing.

- Commitment to managing for the future vs. today. When we mediate between what should be done and what people want, we do less than what should be done.
- What should be done is balanced against what's doable (economically and politically). Our environment is our economy. Don't compromise.
- Fisheries management can learn from practices elsewhere.
- Quit doing things that don't/haven't worked – re-deploy those resources to more effective measures.
- Long-term actions and initiatives are needed. Don't arbitrarily suspend efforts after a short-term effort.
- Get public input regarding management strategies. Strive for practices most can live with.
- The slide (What does the fishery manager do?) was disturbing in its reference to finding a "balance" between competing interests. The reef should come first. They should not be compromised by "balancing" of interests.
- Don't put a lifelong kapu on a particular species. This was done with green turtles. Prior to the kapu there was an abundance of seaweed when the turtle populations were smaller. You don't see beach wash of seaweed anymore. The turtle's consumption of seaweed has removed an important food source for other species.
- Define fishing as a privilege vs. a right.
- The state should put money into the restoration of habitat
- Fire most of the people in the Honolulu DAR office.

3.) What information needs to be collected to help managers make good decisions?

General

- Need data all types to make better decisions
- Make it easy – a 1-800 number to call in with catch
- At harbors post catch report stations, like hunter check-in stations.
- Do the reporting locally within the community
- Work with fishermen (private, commercial, and aquarium) to get accurate information on take. Provide incentives to share information freely.
- Survey in the field
- Complete survey of off shore waters and coral reefs, how many people go to different areas how may fishermen, gatherers,
- Real catch reports, overall abundance of species
- Scientific studies must continue; data analyzed; provisions need to be set in place, state and fed. Agencies must be responsible in sustaining resources – activity whole heartedly

- Creel and market surveys; harbor creel surveys; interview fishermen and Kupuna; need widespread fisheries dependent and independent monitoring annually statewide including EFH and other habitat and ecological measures.
- Fishpond data would be helpful. If restored, would they provide stock for pole fishermen and aquarium fish collectors – that would take pressure off the reef resources?
- Select list of anthropogenic impacts. Brainstorm procedures accordingly. Look at changes and identify what is "man induced.
- Talk to people who snorkel or frequently to find out what they see or don't see over a long period of time.
- Poll of public opinion – where public will support conservation.
- More Science

Impact Assessments

- Impacts of various activities, including snorkeling, diving, and all types of fishing.

Gear type/effort:

- Fisheries data – eg. Catch data
- Catch per unite effort, sustainable yield
- Gather more information about cage aquaculture. Examine these and other new methods/technology. Need safety protocols in place for these to prevent the spread of disease, etc. Bottom line considerations should compromise the security of the cages.
- How fishing is done is important too. Compare impact of single fisherman using a hook and line with net use.
- Assessment of take from all means – netting, spear, hook and line

Recreational fishing:

- Recreational fisheries data
- Look at historical records – interview folks before their gone – Kupuna
- Give data sheets on a voluntary basis to recreational fishermen
- Impacts for recreational and subsistence should be compared with commercial fishing impact.
- Scope and impact of recreational fishing. We need to understand this better.
- Survey diving and scuba groups sport fishermen, etc.
- Recreational catch data
- How many recreational users, commercial users, breakdown of user groups total take by all users, breakdown this take, current level of resources.

- Recreational and subsistence fishery catch data; Creel surveys

Ecosystem assessments:

- Need more assessment on current conditions as to the state of the reef. Invertebrates as well as fish of recreational and commercial interest.
- Rank biodiversity of shoreline areas. A for intact to z for irretrievable
- Long term monitoring of resource. Train people in communities to help?
- Measure the health of coral reefs by noting the frequency and size of fish, the percentage of coral to note improvement. Establish benchmarks.
- Long-term monitoring of coral reef ecosystems, including support of volunteer monitoring efforts, need info on recreational as well as commercial fishing
- Define what the targets are. % of live coral in a healthy reef – what is the goal? Set targets associated with size, distribution, frequency of fish as well as other indicators that would facilitate comparisons with healthy areas.
- Find out what we have via divers, satellite, and shipboard imagery. Use these tools to track changes and for long term monitoring.
- A census of the reefs
- Fish and condition of the reefs itself needs to be analyzed, a lot of damaged areas out there.
- Biological reef surveys denoting key species, distribution of population density and comparative reef studies.
- Status of reef right now
- Baseline assessment of all coral species and aerial surveys to monitor changes of the reef.

Socioeconomic studies:

- Governor needs to realize the value of the reefs regarding our economy. Do more to protect this environment. Caesar study of the value of the ocean environment to the state economy.
- We need accurate data regarding the numbers of users interacting with the resources. Licenses might yield data in the different use categories.
- Collect information on users of the reefs and their needs both marine and human.

Species Assessments:

- Species specific regulations would benefit from more data regarding the interactions between species within a community.
- Life cycle requirements need to be better understood

- More studies on the life histories of various species and recruitment would help.
- Ecosystem based studies needed to determine habitat health and knowledge for all life stages of key species such as uhu.
- Do evaluation studies (See Matt Parry) to find out how much fish are out there and impact of fisheries.
- There needs to be first hand observation by diving in various areas to check on the health of marine life. Counting fish from fisherman's report is an okay indicator, but there is a lot that is not being reported. Did you ever witness a commercial trapper's or bag netter's off-load? What do you think their by-catch is? It's about roughly 20 to 30% of un-marketable fish/marine animals that gets caught in their traps or nets and dies in the process. You **won't** find that info on their catch reports.

MPA Assessments

- Compare Kahoolawe and main Hawaiian Islands resources.
- Measure the spillover effects of protected areas by gathering data immediately outside the boundaries of same. Philippines may provide useful information. The information needs to be credible with fishermen.
- Good tools have been tried. Some of them sound scary to fishermen (FMA's etc.). Verify the efficacy of these to fishermen and get the word out.

Pollution

- What kind of non-point pollution is going where with what impact?
- Study to determine how many and who are hooked up to the sewer lines monitor the cruise ships.
- Sources of pollutions and soil erosion
- Soil erosion impact on recruitment areas warrants attention. Identify these areas; gather data tracking non point source pollution. Sewage leaks, discharges (Iriquois Point – Keehi Lagoon). Treat water to at least nonpotable use levels.
- Impacts of runoff, loss of stream flow

Management assessment

- Feasibility study on current paradigm. Consider existing bag and size limits, assumed knowledge and voluntary compliance with rules, and the current circumstances of periodic enforcement. Is this a realistic way of managing resources for future generations?

Historical Information:

- Compare the past and present state of the coral reefs

- Research ancestral information from users; in the absence of "good science" (which we have little of) the "precautionary principle" will be emphasized; we need more funding for resource research
- Track invasive macro algae sites. Note size, location, growth rates, etc.
- Gather history and other important information from the "old timers" to understand how it was – to better understand the shifting baseline syndrome.
- Interview the old timers – get into the water with them to see and learn first hand. This information is disappearing.
- Senior fishermen collected knowledge in villages to inform their stewardship efforts (tracking species on a seasonal basis). They are active daily and constitute a good source of information.
- Historical information regarding past abundance – gather and analyze this.
- A historical component such as Hawaiian use and what they were like in the past.

Invasive Species

- Rate of species invasions needs to be better understood

Build Communication:

- Listen to the fishermen about other causes of problems. Take seriously their observations re: generational time frame – impacts on fisheries.
- Lots of knowledge resides with the fishermen. Get the managers into the field more to learn more about the resources – from the fishermen in the field.
- Talk more directly with the fishermen.
- Get out into local communities. Reach others that are not inclined to attend meetings. Build communication opportunities between users (fishermen, recreational users, and managers).
- More input (better turn out at meetings get the fishermen to come)

Other Thoughts:

- Those well connected attend meetings, favoring community operations. Lowly fishermen never represented.
- People working on this project need to go all around this island and check out the conditions and protect all areas that are not in danger now.
- DNLR bureaucrats need to get into the water frequently in order to observe what is happening to our reefs
- None – there is plenty available right now
- There is plenty of data around – time to act on
- Shift the focus to areas where potential or actual management likely to work. Take action where people are ready to act. Work with them.

- Encourage and support experimentation with these initiatives. Reach out to groups to develop and support long term initiative
- Look at successful models elsewhere. Send managers to see them.
- Reef watcher program uses non-scientists to gather data.
- Commercial tourism boaters have not "official" state moorings – signage "please don't feed fish/ walk on reefs – limit anchor damage

4.) What do you think is the most important issue in Managing Hawaii's Coral reef Fisheries?

Education and outreach:

- Education first!
- Get everyone on the same page local guys help monitor resources
- So much supports for the farmers – all types of resources, soil analysis, data, subsidies – need support for the fishermen - develop cooperative research, other cooperative programs
- Hotels close to shoreline should engage guests in education via signage etc. re: the coral reefs.
- Find incentives to engage these stakeholders.
- Fish and resource depletion and degradation of ecosystems; education of the public – reef ecosystems awareness
- Public knowledge of what is happening to the fisheries
- Getting public more information about what's happening to ahupua'a. Take this information to the communities.
- Get best practices out to a variety of audiences. Communicate these to users in ways that match their educational and skill levels.
- Teach off what's "in the tool box". Why are these important? Provide background and reasons for the necessity of/rationale for enforcement.
- Have to get a fishing license with fish education classes in their language as a prerequisite for a license
- Making everyone aware (visitors and residents) that our reefs are being destroyed

Enforcement:

- Develop incentives for "doing the right thing", e.g. beer, free gas, etc.
- There is apparent lack of enforcement – need more
- Don't want to make the "good guys" feel bad – need to have everyone on board
- Staff for enforcement – enact! With consequences.
- Community involvement to support enforcement. Fishermen, boaters, crews, hotels, beach shacks, anybody having something to do with getting people into the water. Create a forum for participants.

- Effective enforcement of biologically meaningful regulations
- More enforcement
- Strong enforcement of existing laws, and levying penalties with deterrent value.

Marine Protected Area:

- Need to set up restricted areas
- Identify critical recruitment areas – support these to promote population growth of targeted species.
- Larger and more protected areas – make some permanent.
- Need for larger and more protected areas with stronger political support. Broaden the base of support for this.
- Political action to directly limit development and use
- Protect more areas with more awareness hopefully there will be more support to protect and preserve what we have left.
- More no-take areas as insurance for the future
- Designating marine protected areas

Change mentality of people:

- Fish is a special food – needs to be available
- Ethics of different groups of fishermen: take all vs. sustainable practice of taking a few.
- Persuading the residents that protection works; change the mentality that catching the “Big” fish is best.
- Impress upon the people that we are the caretakers – it’s up to us; there is no time to waste – action needs to be taken now by government, communities, all.
- Strong opposition by fishing community to expanded use of Marine Refuges - need to overcome.
- Create a feeling of involvement for absent stakeholders.
- The host culture had a natural resource management approach. The idea of aloha/sharing resources vs. commercial valuation of resources and/or competitive acquisition of same warrants consideration going forward.
- Getting all interested parties to agree on importance and benefits.

Ecosystem function:

- Coral reefs ecosystems have lots of inter connection – need to look at all the habitats
- Over fishing/overuse
- Status of the reefs right now
- Protection of habitat while gaining insight into fish life histories.

Funding:

- % of revenues from Hotels should be dedicated to coral reef protection (in their vicinity.).
- Increase the availability of resources.
- State expenditures lag behind other places re: resource management and protection.

Preservation:

- Having resources for the future.
- Having resources for multiple user groups who want to use the resources in multiple ways.
- Managing for future generations is important. It is unethical for us to take so much today and not leave enough for tomorrow.
- Hair" model – we have to avoid getting to a "bald head" situation where we experience loss of the resource. Increased human impact is resulting in losses that are difficult if not impossible to restore.
- Making sure resources are not used beyond maximum use and lost

Gear Restrictions:

- Stop night spear fishing, stop cross nets
- Stop lat gill nets
- Stop commercial spearfising, stop the sale of speared fish
- Prohibit gill and bottom netting in coral reefs. Also night sprearfishing should be strictly prohibited.
- Restricting high-impact users like gill net users
- Destructive fishing practices

Regulations:

- Our regulations need to be translated for immigrant group languages. This should be accompanied by outreach and education, etc.
- Decreasing take
- Like I mentioned earlier, control the fishery with regulating the take on marine animals based on data and by direct observation. The key is CONTROL of the fishery by establishing BAG LIMITS and SEASONAL TAKES, and NOT BANNING OR ESTABLISHING more MLCDs.

Restoration:

- Get some of our reefs or protected areas to look more like the NWHI.

Reduce Pollution:

- Non-point source pollution and overfishing, habitat changes, invasive species - #1 outreach and education.
- Non-point source pollution
- Habitat loss/pollution
- Reduce secondary impacts on reef, non-point source pollution

Coastal Management:

- Control destruction of shallow shoreline coral reefs
- Overuse by people in popular parks, no monitoring or control of run-off and dumping on Hamakua coast power plant and cruise ships
- soil erosion.

Community involvement – community based actions:

- Build alliances with the community.
- Getting more local management – community based grass roots efforts work.

Invasive Species:

- Invasive species, must find way to fight invasive algae
- Stopping invasive algae.
- Stopping non-native animal species from being introduced.

Overfishing

- Stop overfishing
- Overfishing
- Unrestricted fishing, overfishing

Over use

- Overuse
- User conflict; there is as much a right to see fish as to catch a fish, if not more.

Increase/Improve Management:

- Lack of resource management and enforcement personnel in the field and on/in the water; get folds out of the office especially on Oahu; critical lack of leadership and vision of senor managers with credible scientific resource backgrounds.

- Important to cooperate at the policy and management levels. Clean house. Foster more respectful relationships between agencies. Focus on getting the work done. Quit "beefing."
- Better protection is needed. Don't assign a diesel mechanic to care for finger coral. Work toward a better match between people with experience, qualifications, and best practices and stewardship tasks.
- Get DAR to seriously manage resource, make hard decisions

5.) What specific outcomes should we set as goals for management?

Sustainable Management:

- Sustainable fisheries = sustainable ecosystems
- Manage in a way that is sustainable for future. It's not just about us, do it for our grandchildren.
- See kids and Kupuna gather and fish in the future. Access to healthy shoreline.
- Sustainable ecosystems
- Protection – positive change – drastic change; healthy reefs – clean oceans.
- Sustainability of fisheries is prerequisite to continued fishing.
- Sustainable harvest for local users while maintaining and restoring fish populations.
- Resources not depleted, allocation for all users, enough for the future

Education:

- Education for every student in the state
- Provide resources for the teacher to ensure the education is provided
- Education to win public support for resource protection long-term (generational commitment)
- Educate more users including tourist

Restore conditions:

- Take us back to the way it was during our grandfathers' time
- Restore sections to healthy in tact ecosystems for 50% of the coastline
- To restore coral reef fisheries to a state closer to pre-western influence of Hawaii.
- When reefs are filled & diverse species again; reduce use and conflicts of use
- Healthier more productive reefs as evidenced by increases in % of live coral, average size of fish, increased diversity, increased % of cover, increased numbers of species.

- Restoration should be the focus vs. merely slowing the rate of degradation.
- Healthier more productive reefs as evidenced by increases in % of live coral, average size of fish, increased diversity, increased % of cover, increased numbers of species.
- There will no longer be conflicts related to overuse or use because there's enough for everyone.
- Improvement in "health" of coral reef ecosystems, including increases in size and abundance of key fish species such as herbivores, plus percent live coral.
- Recovery of all species to estimated population in 1903.
- Increase fish population along shore. Work towards seeing coral growth on what remains.
- Restore reef fish population to levels they were 60 years ago.
- Restoration of top predator populations - they reflect the overall health of the reef.
- Boat moorings
- Increased diversity of ecosystem, better balance of predators, less take

Marine Protected Areas:

- Select and area as a protected site to start this strategy
- Create more protected areas;
- Set aside more marine reserves and limit fishing there
- Protect areas for reproduction and recruitments of fishes, protect sensitive habitats avoid destructive practices.
- Marine protected areas
- Pupukea MLCD Example of how not to allow commercial activities to wreck disorganized local opposition.
- More MLCD
- Protect more coastal areas from some/all activities
- Set aside marine reserves/restrictions and laws to protect the growth process of reefs.
- Protecting more areas and making sure that these goals area seen as a long-term solution and not a one time fix.

Reduce Pollution:

- No ocean discharge permitted. Make use of pumps for septic tanks at harbors mandatory.
- Make sure cruise ships have holding tanks for their waste and have government inspect

Enforcement:

- Enforce rules to protect the area
- Enforcement of sustainable fishing practices

Funding:

- Increase funding to DLNR
- Get funding for education and enforcement

Stop Shifting Baseline:

- No further degradation from the current baseline e being established by reef watchers etc.; consolidate regulation makers in one agency
- Stable or increasing CPUE from this point forward.

Cultural:

- Balance between social, cultural, and economic interests.
- Look to the host culture where generation responsibilities were entrusted to and enacted for those to follow. There was regard for the needs of future generations. Responsibility to preserve for the future – should be incorporated into current stewardship efforts.
- There is no more “color” in Hawaii. Hawaii residents are Hawaiian regardless of color.

Conservation:

- Focus on conservation vs. satisfying all perspectives.
- Protection of coral reef substrata. Reduce damage to corals (using set backs etc.).

Regulatory:

- The process to change the rules and laws is 2 weeks vs. two years.
- Set forth the program to include the already established minimum size/weight limits on marine animals and establish new bag limits. Have enforcement officers in places as mentioned in paragraph 2 above. Then test the program for 5 years and see how the fishery improves. Inform the public that bag limits will be adjusted (increase or decrease) for recreational and commercial take according to the observed health of the fishery.

Improve coordination:

- Cooperation between various agencies – elimination of turf battles let the interested public set up a workable plan using input from many sources.

Management:

- Create a management plan where all resource users can share in the resources
- More responsible management

6.) What management measures are working?

Seasonal Closures:

- Seasonal closures

Area Closures

- Areas closures are working
- Protected areas are working, MPA's!
- No take MPA's Hanauma Bay – Ahihi-Kina‘u NARS on Maui is working. Variety of schools of large fish noted.
- MCLD's,
- Protection from aquarium collectors, MPAs
- Protected areas, MPAs (Kealakekua Bay)
- Marine conservation districts – marine protected areas; there aren't enough closed areas;
- FMAs – FRAs for aquarium fisheries in W. Hawaii
- MPAs
- No-take MPAs such as Hanauma Bay and Ahihi Kina‘u
- Pupukea MLCD – introduction of some restrictions is making a difference.
- Making MLCD's bigger with restrictions.
- Hanauma Bay is an example of management measures that are working.
- Coral cover pretty good around Kaneohe Marine Base Hawaii where there are restricted access areas.
- Kealakekua Bay MLCD is working.
- Community-based management backed by research could measure what we're doing and assess our progress. Use science as reality check. Practices have to make sense.
- More explicit community-based management as codified in Act 306 could work.
- The kapu system worked.
- The enforcement systems in effect during the traditional kapu designations – also worked…
- Hanauma Bay – contains at least 85% of fish biomass on Oahu.
- Marine protected areas
- Limited establishment of MLCDs

- Molokini is good example of a step in the right direction. Now that it's a reserve and there's a mooring system in place, you can se some improvement.
- MLCD's and other marine reserves
- Marine protected areas: MLCDs, NARs, FMAs, FRAs,

Community-Based efforts

- Molokai Mo'omoni working for Molokai – Kahoolawe process
- Community- based monitoring is working
- Community-based education and enforcement. Molokai residents "talk" to off island fishermen.
- Fishponds – Hawaiian traditions work in the right places.
- Community-based management – e.g. West Hawaii Fisheries Council.
- Community based management

Gear restrictions:

- Banning scuba spearing – it seems to be working in Samoa.

Size Restrictions/bag limits:

- Sizes of fish, require them to be bigger
- General limiting of fish collecting has helped increase the number of juveniles in certain areas.
- Increased size limits, bag limits
- To a certain extent, the new minimum size regulations
- Minimum fish sizes
- New size limits and bag limits

Education outreach efforts:

- Education campaign – Russell Sparks from DAR working on. "Don't take the biggest fish…." The message is getting out there
- Young kids are learning about resources. Some kids are concerned about the environment.
- Signs in popular parks telling people how to behave in the water
- Strong education works. Demonstration utilizing 86 smaller fish with their egg output compared to the egg output of a single large mature fish – made point dramatically
- "Get the drift and bag it" campaigns seem to work, do something similar for fishing.
- Education

Data collection efforts:

- Data Collection
- Great improvements noted in completion of C3 forms, dealer reporting, validating #'s of fish sold at auction. Good improvement in data availability for commercial catches.
- Creel surveys - starting to work – need more
- Fishermen cooperation in tagging and catch counts

Aquaculture:

- Moi farming and aquaculture is working. These efforts reduce pressures on the natural supply.
- Non polluting moi aquaculture methods used locally are better than practices employed in salmon farming elsewhere.

Mooring Buoys:

- Day -use mooring buoys are working. Significant reduction in coral damage noted.
- Once there were sand patches. Now there are none. The use of a rotating mooring system has helped the areas damaged by anchor contact

Other things that are working (or not):

- From what I observed, very little management measures are working. It's the Wild Wild West out here, and people are doing as they see fit for themselves. I see and hear of all kinds of illegal fishing activities and it's a direct result of a lack of enforcement. In all my years fishing, I have only met up with one enforcement officer. The DLNR can make up all the laws they want, but laws are meaningless without strict enforcement.
- 1968 you could eat sea turtle on restaurant menus. The population has recovered nicely since the protected status enacted.
- None in Hawaii
- Storm water BMP's,
- None that I can observe @ Kealakekua or Honaunau
- The presence of unexploded ordinance did wonders for Kahoolawe – keeps people away.
- Opelu/akule seem prevalent… "Get fish."
- State recreational tagging program is popular (for ulua and papio).
- Progress on point source pollution regulations and non-point source pollution starting to get attention.
- Local action strategy – the local action can work. See examples in the Pacific Islands.
- Waikiki project to remove alien algae (Aohe Limu e) resulted in the removal of 63 tons of algae.
- Act 306 worked – it stimulated dialogue.

- Artificial reef areas
- None except to crow locals into the least desirable, most inaccessible areas, saving best areas for commercial and tourism activities certainly not enforcement of laws, certainly not by staff from aquatic resources with preconceived ideas.
- None since the resource is declining and users are not happy
-

6b) What doesn't work?

Public Process:

- Need to have the discussions on regulations at the community level
- Not enough education of public, meetings to allow people to discuss and organize methods to improve the reefs.

Enforcement:

- Enforcement not working – need to involved police and others
- Focus on the big management issues for enforcement – illegal fishing or hunting – not incompliant trailer
- Current approach of piecemeal, incremental measures - difficult to enforce. Doesn't make anyone happy. Death by paper cuts (Size limits, gear changes, etc.)
- Bag and size limits – no enforcement
- Enforcement is lacking funds and resources; need a public "coast watch" efforts and training. We need a natural resources court for resource related laws breakers an educate the judiciary
- Enforcement of existing regulations.
- Enforcement doesn't work. Argue for stronger penalties, consistent enforcement and close loopholes.
- Enforcement practices over the past 30 years (and what's currently in place) are inadequate.
- Enforcement – lots of laws but not good if not enforced
- Enforcement is lacking
- Not a severe enough consequence for violating rules in reserves and not big enough presence by DLNR to try to deter any violations
- Poor policing of commercial fishermen.
- Bag limit for oama, releasing undersized fish from nets, no fishing areas – all because of enforcement and very lenient fines – breaking the rules has no consequences or repercussions.
- Enforcement

Coastal Development:

- Hardening of shoreline. The Natatorium on Oahu.
- Dredging at Hawaii Kai for boat access. Not an estuary anymore. Killed reefs all the way to Kahala.
- Rampant shoreline development. Canalization of streams interferes with ocean life.

Invasive species issues:

- We don't screen for invasive species that are now coming out of ballasts, etc.
- Species introduction is not adequately controlled in the state.
- White list – what you can bring in to the state.
- Aquarium fish brought in that are subsequently released into streams and oceans – can create problems.

Individual accountability:

- People don't do anything. They allow others to continue in their destructive behavior(s).
- Personal responsibility – take initiative to become knowledgeable about alien species; how to identify and properly remove them.
- Ignorance is <u>not</u> working.
- The idea that there is a "right" to fish. Fish and other coral reef resources are public trust resources and fishing is a privilege not a right.

Current Fishery Management actions:

- No opihi management plan exists – other than to address size. Haven't seen large opihi on O'ahu in a long time.
- Seasonal closures on even and odd years has had some positive impact, although all fish fished out within days of opening. Spillover works both ways – there is some encroachment on the protected areas as well as contribution from the protected areas to the surrounding areas.
- Existing system - no enforcement when needed
- Size limits, gear restrictions. Gill netting should be banned or much better controlled.
- few areas protected
- Minimum size limits (also maximum size limits)
- allowing use of any sort in protected areas.
- Waikiki FMA on one year and off the next year isn't working. Close Waikiki as bigger MLCD
- 1987 to present methods employed not working. Size limits, gear type restrictions and other traditional "western" methods are not working.

- MPA's are a good idea, but may not be working as well as hoped. Once designated, they sometimes attract increased use and anthropogenic impacts.
- New fishing rules re: size are good, but net eye size hasn't' changed. A 2 3/4 eye is still legal and will still catch illegal fish.
- Piecemeal changes of fishing regulations
- No management at all
- Pulse fishing (on again, off again)
- Get rid of West Hawaii Fisheries Council.
- Permitting, gill netting, spearfishing using scuba. Human use should be limited in high-impact areas.
- Top-down reactionary management, legislative management, DOCARE

Funding:

- Low funds

Political Will/Agencies

- Need more guts.
- Elect legislators who care about marine issues. Don't vote for golfers.
- Stagnant government agencies; inaction by agencies who mission is to sustain our resources;
- Bill to increase MPA's at the legislature was defeated. Approach to passage of measure hasn't worked. Link this to educators.
- Advertising campaign. Taape are the ones to ask for.
- State coastal zone management system isn't working as well as it could. Integrated coastal management can work. Still not as "integrated" as desirable. More directive involvement in some issues at county Vs state levels.
- Decisions driven by job security or political expediency should, instead, be influenced by science and community input.
- There is a lack of political will to act on what we know.

Education:

- Little public education effort, low media profiling of danger of coral reef fisheries and reefs.
- Misinformation about state of fisheries resources

Other Thoughts:

- Most else; open decisions – making and spending of funds for coral reef fisheries conservation should be open to the public and decided by a committee of state; local and fed. Agencies, NGOs and the public.

- Fighting, cocktail sauce, opihi poke
- Not enough of the things that are working.
- Stop arguing – stop the conflict. The present system and processes are not working. They are promoting more conflict.
- Open access systems not working in Tonga. Changes were made to close access, which resulted in improvements in conditions.
- Meetings, meetings, meetings… turf battles. I sometimes think that the "professionals" lookdown on and won't accept contribution from "civilians" will/can make.

7.) What role should fishermen play in managing coral reef fisheries?

Increased Communication/gain support:

- Need communication with fishermen
- Get hui's - coops to support the issues

Assist in collecting information (data reports):

- Need more than catch reports
- Fishermen know places and their conditions over time. Engage older fishermen who know the practices and places, etc.
- Fishermen – consult with them about the changes they've observed too.
- Take advantage of fishermen's knowledge – encourage them to contribute.
- Source of information
- Fishermen need to be involved. Many of them are a source of knowledge that should be utilized.
- They are a great source of information on what out there

Cooperative Research:

- Cooperative research for new fisheries and resource assessments
- Steer towards new fisheries
- Analyze market and fishing economics. Figure out ways to increase the margins on fish that get to the market – figure out ways to reduce waste.

Develop fishery councils

- Fishermen's advisory councils.
- Board and advisory council memebers

Stewardship:

- Can't have a free for all. Get the message across to fishermen.

- Have fishermen practicing Hawaiian style (take only what you need) and teach this to others.
- Be resources regarding the life biology, history of species of fish.
- Key fishermen that could be role models vs. white conservatives.
- Be good stewards.
- Fishermen should play as large a role as other stakeholders.
- Responsible aquaculture could take pressure of natural resources. Atlantic salmon and Pacific Northwest salmon farming are not good models to follow. Specimens escape and breed with open water species.
- Understand resource, learn sustainable yield concepts, learn to enhance resources.
- They have a vested interest in managing fisheries and could be included.
- Alaskan wild salmon are managed well by native groups.
- Protect stocks for future
- Insist that county and state agencies protect our reefs
- Divers and educators should have just as large a voice as fishermen.
- All ocean users have vested interest in being part of solution.
- Active role for their own Ahupua‘a
- Guardians of the reefs- give them specific guidelines, lists of rules and regulations to report and abuses
- Be responsible and realize that they also impact our resources by overfishing. They are part of the problem and can be part of the solution
- Fishermen self-policing – is it possible?
- Stewardship
- They need to fish responsibly as for what is getting over caught as by catch and overfishing any one particular species
- Recognize that sustainability means no more free for all
- Be responsible not to do damage
- Limit catch
- Fishermen need to understand that, if we continue with our existing management program, we will not have enough fish to support recreational and commercial fishing activities. A recent trip to French Polynesia proves this point where their lack of fishing regulation from previous decades has left them with barren reefs. Tahiti and surrounding islands have pristine waters healthy coral reefs but no fish. This kind of disastrous situation can and will slowly happen to us if we don't do something now. The current laws and regulation in place are archaic and are not paralleling increase in population and fishermen in regards to the taking and consumption of marine animals in the state of Hawaii. Commercial fishermen especially need to realize, that at the rate we are going, there will be no fish worth surrounding or trapping, and that their way or life will not perpetuate to future generations. There is no choice in matter, we need to regulate now or not fish latter. I hear a lot commercial fishermen blaming pollution or claim that the fishery is healthy, they need stop fooling themselves, its over-fishing! What I have proposed above is not a ban on fishing, or a ban on a certain type fishing method or

group of fishermen, but to control and regulate the take of marine animals so that we can ALL use and enjoy the ocean for future generations to come. Regulation is a win-win for everyone involved, from the recreational fishermen, commercial fishermen, retailers of fishing supplies, dive and fishing charter groups, and everyone involved in fishing activities. We need to take CONTROL of our fishery!

Assist in Education efforts:

- Let's go fishing – create a TV program focusing on cultural and local knowledge.
- Educate the kiekie – share the knowledge.
- I'm speaking strictly for shore based fisheries, but they should be teaching keiki

Increase Involvement:

- Local resource councils (outreach from Western regional fisheries) might be the vehicle. Provide food and a "bait" issue.
- Individual interviews conducted in Belize. Provision of food and beverages recommended.
- Talk to the wives and mothers of the fishermen – enlist their attendance at meetings
- Get fishermen involved by providing financial incentives.
- Regular attendance at the Western Fisheries meetings would help.
- Fishermen should be very involved. It is challenging to assemble fishermen to involve them – especially relying on these kinds of meetings. We need to find ways to bring them together to figure out how to tackle issues.
- Go out and talk to the fishermen individually. information.
- They should be involved – along with other stakeholders.
- Pay them as enforcers (why not have maximum size limits? The larger older fish are the best breeders)
- A core/central one – get them into the meetings and on board
- A major role since we are dependent on the habitat of the fishes that we are catching. Fishermen should be involved in any decision-making since it will affect us greatly.
- They are the most important people (user), they should be responsible for following regulations, involved in any and all rule making process that affects their issue.
- Get involved and fight for the right to fish as hard as possible.
- Meetings and committees (I attended a lot) should be by a percentage of people in each group be it fishermen, netters, ect., not I from each group
- Get more involved in management, enforcement, tagging, and science

Provide training:

- Fishermen should be required to go through instruction similar to that required of hunters prior to securing hunting licenses.
- Like the idea of a natural resources court and fishermen classes

Develop licensing program:

- Fishermen should pay their fair share. A $50 license fee for a commercial permit? Fees should be reconsidered in light of the commercial gains derived from the use/access to the resource.
- All commercial fishermen should be required to attend an pass a 30 hour class on coral reef fisheries and management in order to maintain license.

Other ideas

- They're all important because they are taking the fishery away.
- Leaders of fishing organizations especially need not be more constructively engaged in the future so they do not obstruct efforts to address overfishing.
- Commercial fishermen have conflict of interest. Competition motivates them to take what they can get.
- Fishermen are key. Collaboration with them is important. They hold the wisdom and knowledge essential to solving the problems. They are one of the most important resources. Cooperation and support of them is necessary.
- A five-year "leap of faith" may be needed to give these approaches time to work.

Other Observations/Comments

- Absence of key stakeholders at this meting to get fishermen to the table.
- Provide more advanced notice to publishers etc. with bigger ads.
- Kauai's rivers once rich with biodiversity. Barracuda, etc. plentiful. Management strategy needs to be specific to subject area.
- Human impacts are not always apparent even with all scientific research. The reality is we have negatively impacted tall our resources and unless stringent controls are enacted – we'll lose our source of connection with the chain of life.
- Finding a "Balance" is an impossible goal. The health of the reefs should be the only goal.
- Sustainable fisheries and coral reef ecosystems are different issues. Clouds of manini grazing actively on algae one day and removed the next can have significant impact on the reef conditions. Sustainability as it relates to species reproduction deals with different issues than the

consequences of species removal on coral reef conditions (resulting overgrowth of algae).

- It would be helpful to be able to look at a map of the areas subject to discussion. Participants were encouraged to check the web site: www.nos.noaa.gov. Biogeography program.
- It would also be helpful to have a map, which showed specific depths, ship discharge areas, sewage outfall areas, and types of coral present in the affected areas.
- Another reef related web site: www.reefcheck.com.
- There is a new chapter of Reef Check on the North Shore.
- MHI consider each islands circumstances to reflect population, use, etc. Generally, O'ahu most adversely affected.
- There are different species of coral and types of surf action in Belize. This may account for reduced presence of branching coral in Hawaii?
- What were the major causes of Hawaiian Coral Reef Degradation in 1998: This slide indicates that O'ahu has been seriously affected by anthropogenic impacts. Development on the big island is likely to precipitate a high rate of change in the coral reef resources status here.
- The rate of change (development related) on the big island may warrant reallocation of resources to this island to stem rate or extent of degradation.
- It's less expensive to preserve what we have than it is to restore what we've loss
- The recuperative prospects of areas will vary.
- Is coral transplantable?
- After storms – should we set coral upright or leave it undisturbed?
- If allocating scarce resources – we should spend more on action and education vs. more research.
- Need a better answer than taape.
- Catch the taape and taau.
- Cards with information regarding nonsustainable harvesting methods are shared with consumers to help them know which fish to avoid in markets. Contact the Aquarium education department for more
- Moi and other examples of constructive local aquaculture are worth investigating
- Find the positives to bring people together to act.
- With the 28 million why aren't basic interventions being funded? For example – signs to inform users; educators (paid) at use sites; and printed info at hotel room /on arrival at equipment rental stores.
- Each Island needs a different approach /funding – being in the best condition according to the triage type guidelines – the majority of the funding should be used in the environment in the best condition.
- Guidelines should be set up whenever reviews of established management procedures initiated. Who makes these decisions now? How can the public become involved?

- Cumulative impact integrated approaches work better than single interventions.
- American jurisprudence isn't working for Hawaiians. Restore the Hawaiian Nation.
- Everyone should talk Hawaiian within Hawaiian boundaries. Communication is not working.
- Communication and competition issues are problematic in a number of industries and sectors.
- Remote communities have additional options regarding enforcements – the commons.

How to reach more fishermen:

- Post form on the net.
- Put the survey form in the newspaper and other ads with return address.
- Hire firms to do the surveys.
- Distribute surveys at docks, dive shops, fishing supply stores, fuel docks, boat yards, and markets.
- Translate survey into other languages.
- Tailor versions of the survey to different target populations.
- Make it easy to mail the forms back or provide a submission/collection box.

Miscellaneous Reactions to Power Point Presentations:

- Are there finger coral studies or data relating to the status of this species? Response: Some information is available via DAR at DLNR.
- Hawaiians have a role to play in helping to restore the coral reef systems.